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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,775	07/31/2001	Hisato Oyamatsu	002372.00027	1487

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EXAMINER

HU, SHOUXIANG

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 01/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/917,775

Applicant(s)

OYAMATSU, HISATO

Examiner

Shouxiang Hu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8 and 16-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 8 and 16-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. Fig. 3 is objected to under 37 CFR 1.83(a). The drawing must show every feature of the invention specified in the claims. Fig. 3 shows a SRAM cell with a well isolation structure (53) having only one width. Therefore, the subject matter of "a second width of said well isolation structure between said third and fourth device regions" in a SRAM cell as recited in claim 8, which depends on claim 16, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 8 and 16-18 are objected to because of the following informalities/defects:

In claim 8, the term of "as static RAM cells" should read as –as a static RAM cell–, in accordance with the specification (see page 6, lines 5-7).

Each of claims 16 and 18 recites the terms of "oppose to each other" and "not to oppose to each other." However, such terms when used to define the positional relationship between the first and the second device regions or between the third and fourth device regions may not definitely reflect the subject matter of the instant invention, because the recited first and second device regions or the third and fourth

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device regions may inherently oppose to each other in the sense that they are disposed respectively on the two opposing types of well regions on the two opposing sides of the well isolation structure. And, in view of the subject matter of the instant invention, the term of "oppose to each other" should read as something such as: --directly oppose to each other in a face-to-face way--; and the term of "not to oppose to each other" should read as something like: --not to directly oppose to each other in a face-to-face way--.

In addition, each of claims 16 and 18 recites the terms of "second width of said well isolation structure between said third and fourth device regions". However, they fail to clearly define how the second width is defined, as the recited third and fourth device regions do not directly oppose to each other in a face-to-face way.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8 and 16-18, insofar as being best understood in view of the claim objections and the drawing objection above, are rejected under 35 U.S.C. 103(a) as being obvious over Chan et al. ("Chan"; US 6,091,630; see PTO-892 in Paper No. 8) in view of Hirano (US 6,252,280; also see PTO-892 in Paper No. 8).

Chan discloses a SRAM semiconductor device (Figs. 1-3; also see the marked version of its Fig. 2 in the attachment, wherein the corresponding first through fourth device regions are marked in red by the examiner for better communication with the applicant), comprising: a first well of p type (56); a second well of n type (54); a well isolation structure in the form of a trench (62; also see col. 4, lines 17-19); a first device region of n type (an upper left portion of 65) directly opposing to a second device region of p type (an upper right portion of 66); a third device region of n type (a left and upper-middle portion of 65) not directly opposing to a fourth device region of p type (a right and lower-middle portion of 66) in a face-to-face way; wherein the well isolation structure has a first width between the first and the second device regions, and the first width is smaller than a second width between the third and fourth device regions. And, it is noted that the doped regions 65 and 66 in Chan are both active regions (see col. 4, lines 19-23); thus any region within them can be inherently regarded as a device region.

Although Chan does not expressly disclose that the trench of the well isolation structure can be a shallow trench, one of ordinary skill in art would readily recognize that a shallow trench can be formed on a boundary of two wells of opposite types for high degree of device integration with good well isolation, as evidenced in Hirano (see the shallow trench isolation structure 9 in Fig. 2).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to make the semiconductor device of Chan with the well isolation structure being formed of a shallow trench, as taught in Hirano, so that a

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semiconductor device with high degree of device integration and good well isolation would be obtained.

Regarding claim 17, it is noted that the third and fourth device regions in Chan can be readily regarded as having substantially same configuration, such as being rectangular with a same size, as the claimed invention does not further define what is the configuration for the third and/or fourth device region(s).

Response to Arguments

5. Applicant's arguments filed on 11/13/02 have been fully considered but they are not persuasive.

Applicant argues that Chan does not teach or suggest two sets of device regions in accordance with claim 16, the response for is has been incorporated into the new claim rejections set forth above in this Office action. In addition, it is noted that the recited device regions can be interpreted with various different ways, as the rejected claims lack sufficient limitations to further define these device regions.

Applicant's other arguments with respect to claims 8, and 16-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is (703) 306-5729. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

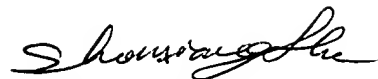
Any inquiry of a general nature or relating to the status of this application or

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proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SH

January 26, 2003


Shouxiang Hu
Patent Examiner
TC2800

Attachment: Marked version of Fig. 2 in Chan